REMARKS

This application has been reviewed in light of the Office Action dated September 2, 2008. Claims 1-9 are presented for examination, of which Claims 1, 4 and 7 are in independent form. Claims 1 and 7 have been amended to define still more clearly what Applicant regards as his invention. Favorable reconsideration is respectfully requested.

In the outstanding Office Action, Claims 1, 2, 4, 7 and 8 were rejected under 35 U.S.C. § 103(a) as being obvious from U.S. Patents 5,517,335 (Shu), 6,757,427 (Hongu) and 5,200,832 (Taniuchi et al.), taken in combination. Claims 3 and 9 were rejected under Section 103(a) as being obvious from *Shu*, *Hongu* and *Taniuchi* taken together, in view of U.S. Patent 5,089,882 (Kaye et al.); Claim 5, as being obvious from *Shu*, *Hongu* and *Taniuchi*, further in view of U.S. Patent 5,809,181 (Metcalfe); and Claim 6, as being obvious from *Shu*, *Hongu*, *Taniuchi* and *Metcalfe*, and further in view of U.S. Patent 6,650,336 (Suzuki).

As discussed in the specification, the calculation of a saturation value of a pixel typically depends on the color differences computed from the components of the pixel. An efficient way of obtaining saturation values is not to calculate them on the fly but to pre-compute them and store them in a lookup table. As the input to such a lookup table consists of a pair of color differences, one simple option is to store output saturation values in a two-dimensional array indexable by a pair of color differences. However, this option generally requires a large memory. Therefore, it would be desirable to find a way to store saturation values while saving space.

The present invention has been made to address this issue. It relates to a method which exploits symmetry in input color difference values among other things (para. [0040]). The method employs a main lookup table to store saturation values for given color differences in consecutive space of a one-dimensional array, where the address of a memory cell that stores the saturation value for a pair of color differences is not readily derivable from the color differences themselves (para. [0038]). It also uses a sub-lookup table, which is addressable by the smaller of the two color differences (or either one if they are equal), to store information for deriving the address in the main lookup table for any pair of color differences (para. [0040]-[0042]). When this sub-lookup table is in place, the main lookup table would be addressable by 1) the output from the sub-lookup table and 2) the difference between the two color differences.

Claim 1 recites, among other features, "creating a main lookup table which stores saturation values for color difference values, and a sub-lookup table... ; determining an address of the main lookup table... on the basis of the value obtained from the sub-lookup table and a difference between the first and second color difference values."

Nothing in *Shu* is believed to disclose or teach the features recited above. *Shu* relates to a system and its control method for enhancing the perceived saturation of a pixel. The method removes an appropriate amount 'delta' from the least intense primary color of the pixel and adds the same amount to the most intense primary color in an adaptive manner. To determine the value of delta, it uses a first lookup table to determine a first value, which corresponds to the consideration of the maximum value which can be transferred, based on the average of the primary colors (*see* col. 7, lines 15-44). It also uses a second lookup table to determine a second value, which corresponds to the consideration

of the continuity of the pixel, based on the difference between the maximum and the minimum of the primary colors (col. 7, lines 58-67).

Applicant first notes that "the first color difference value is equal to or less than the second color difference value," as recited in Claim 1, clearly indicates that there are two distinct color difference values, namely 1) the first color difference value and 2) the second color difference value. In fact, the Examiner has confirmed this understanding in finding support of this limitation in *Hongu*. Therefore, the Examiner's interpretation of both the "first and second color difference values" in the preamble (page 7, lines 3-4, of the Office Action) and the "first color difference" in the creating step (page 7, lines 8-10) as the "difference between a first color and a second color" is not believed to be reasonable. Such an interpretation is inconsistent not only not with the plain meaning of the claim language but also the Examiner's interpretation of the same terms elsewhere.

Applicant further notes that *Shu* focuses on "enhancing the perceived saturation" rather than actually calculating and storing saturation values. In addition, the lookup logic of either of the two lookup tables in *Shu* is independent of that of the other. Clearly then, there is no discussion in *Shu* of storing in a first lookup table values for accessing a second lookup table or storing saturation values in the second lookup table.

Applicant agrees with the Examiner that the determining step is missing from *Shu*. Applicant submits, however, that other features of Claim 1 are also missing from *Shu*.

The portion of *Shu* cited as disclosing "creating a main lookup table which stores saturation values for the color difference values" as part of the creating step discusses merely calculating the first value by looking up the average of the primary colors

in the first lookup table LUT1 (what the Examiner considers as the "main lookup table") and calculating the second value by looking up the difference between the maximum and the minimum of the primary colors in the second lookup table LUT2 (what the Examiner considers as the "sub-lookup table"). It does not involve any "lookup table which stores saturation values," as recited in Claim 1.

The portions of *Shu* cited as disclosing "creating... a sub-lookup table for obtaining a value... for accessing the main lookup table" similarly discuss how to access each of the lookup tables and how input values are converted to output values in each of the lookup tables. Since the access to either of these lookup tables is independent of that to the other, these portions do not involve "creating... a sub-lookup table for obtaining a value... for accessing the main lookup table".

Taniuchi is not believed to remedy all of the deficiencies noted above or disclose the determining step. *Taniuchi* relates to a color image recording device which is capable of color edit processing. The device contains a third color signal conversion unit comprising a third lookup table (what the Examiner considers as the sub-lookup table) that converts an input (L*, a*, b*) value to an output (V, H, C) value (*see* col. 5, lines 5-13). It also contains a fourth color signal conversion unit comprising a fourth lookup table (what the Examiner considers as the main lookup table) that converts the input (H, C) value produced by the third color signal conversion unit to an output (a*, b*) value (*see* col. 4, lines 59-62 and col. 5, lines 31-32).

Taniuchi certainly does not disclose "creating a main lookup table which stores saturation values for color difference values" as part of the creating step of Claim 1. In addition, *Taniuchi* is not believed to disclose or teach the determining step reciting

everything that is necessary for accessing the main lookup table. This is not surprising considering that there is no attempt in *Taniuchi* to save memory space.

The portions of *Taniuchi* cited as disclosing the determining step are as follows:

> "Said third color signal conversion means comprises a lookup table which outputs a hue signal and a chroma signal... , said lookup table using as its input addresses... said first and second color difference signals." Column 20, lines 48-52.
>
> "Said fourth color signal conversion means comprises a lookup table which outputs first and second color difference signals... using as its input addresses said hue and chroma signals." Column 20, lines 57-59.

As can be seen, the address in the fourth lookup table directly comes from the third lookup table. It is not determined on the basis of "the value obtained from the sub-lookup table... and a difference between the first and second color difference values," as recited in Claim 1. While the input to the third lookup table comprises two color differences – a* and b* – it is not believed reasonable to say that the address in the fourth lookup table is "obtained from" both the input to the third color table and the output from it, as recited in Claim 1. The input leads to the output, and having the input to the third lookup table does not add anything to accessing the fourth lookup table once the output from the third lookup table is available.

Furthermore, Applicant submits that it would not have been obvious to one having ordinary skill in the art at the time of the present invention to modify the *Taniuchi* device with features of the *Shu* method, as the Examiner appears to have suggested. First of all, *Shu* does not disclose the creating step. Therefore, it does not make sense to combine *Taniuchi* with *Shu*. Even if *Shu* disclosed "creating a main lookup table which

stores saturation values" as part of the creating step, it is not clear at all how to combine *Taniuchi* with *Shu* so that it might teach that feature in conjunction with "determining an address of the main lookup table... on the basis of the value obtained from the sub-lookup table" as part of the determining step, where there are two lookup tables, the first (main) one storing saturation values, and the second (sub) one storing information used to access the first table.

Hongu is not believed to remedy the deficiencies discussed above. Therefore, for at least the reasons discussed above, Claim 1 is allowable over *Shu*, *Hongu*, and *Taniuchi*, considered separately or in any permissible combination.

Independent Claims 4 and 7 are lookup table and processing apparatus claims, respectively, corresponding to method Claim 1, and are believed to be patentable for at least the same reasons as discussed above in connection with Claim 1.

A review of the other art of record has failed to reveal anything which, in Applicant's opinion, would remedy the deficiencies of the art discussed above, as references against the independent claims herein. Those claims are therefore believed patentable over the art of record.

The other claims in this application are each dependent from one or another of the independent claims discussed above and are therefore believed patentable for the same reasons. Since each dependent claim is also deemed to define an additional aspect of the invention, however, the individual reconsideration of the patentability of each on its own merits is respectfully requested.

No other matters being raised, it is believed that the entire application is fully in condition for allowance, and such action is courteously solicited.

Finally, Applicant respectfully requests that the Examiner conduct a personal or telephonic interview with Applicant's representative regarding this case, before the Examiner takes this filing into consideration. Applicant respectfully requests that the Examiner contact Applicant's representative as indicated below.

Applicant's undersigned attorney may be reached in our Costa Mesa, California office at (714) 540-8700. All correspondence should continue to be directed to our below-listed address.

Respectfully submitted,

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